



SERVICE MANUAL 105



marantz

model 105

Fm / Am
Stereophonic Tuner

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INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 105 Stereophonic Tuner.

Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instruction should be read carefully. No attempt should be made to proceed without a good understanding of the operation in the tuner.

The part lists furnish information by which replacement part may be ordered from the Marantz Company. A simple description is included for parts which can be usually be obtained through local suppliers.

The Model 105 is a tuner version of the Marantz's Model 2010 Tuner/Amplifier and almost the same circuitry as used in the Model 2010 is employed except the audio Amplifier, and power supply circuit.

1. AM Tuner

All components except ferrite bar antenna are mounted on a printed circuit board P100.

The AM signals induced in a ferrite bar antenna are applied to the base of converter transistor H113 through a capacitor of C171, while the local oscillator voltage is injected to the emitter of H113 through a capacitor C172. Both AM signals and oscillating voltage are mixed at the base-emitter junction and converted into 455KHz intermediate frequency. The resulting IF signal is applied to the first IF transformer L116 consisting of one ceramic filter and two tuned circuits.

The output of L116 is led to the transistor H104 which in turn apply its output to the transistor of next stage H105. The fully amplified IF output is then applied to the diode H123 to detect audible signal through the detector transformer L117. The detected audio signal is filtered and the final audio output is obtained from pin terminal J118 and applied to the output jacks through the function switch.

The DC component of the detected IF signal is used as a AGC voltage to control emitter current of H104 through the resistor R185. A part of IF signal output is also applied to the diode H124 through a capacitor C180 and rectified to obtain DC current for energizing the AM signal strength meter M001.

1.1 Suggestions for AM Tuner trouble shooting

Check for broken AM bar antenna, next try to tune station by rotating fly-wheel tuning knob slowly and observe the AM signal strength meter whether it deflects or not. If the signal strength meter gives a deflection at several frequencies received, no failure may exist in the stages at least preceding final IF transformer L117. Next connect a oscilloscope to the pin terminal J118 and check for audio signals with the tuning meter deflected. If the signal strength meter does not deflect, check the local oscillator circuit. Normal oscillating voltage at the hot end of the oscillator tuning capacitor is about 2 or 3 volts, varying with tuning capacitor position. When measuring oscillating voltage use a RF VTVM, no circuit tester gives correct indication. If the local oscillator voltage is normal, check all voltage distribution in the AM circuits by using a DC VTVM and compare the measured values with those given in the schematic diagram.

2. FM Tuner

All components are mounted on a printed circuit board P100.

FM signals induced by a FM antenna are led to FM antenna coil L101.

These signals are then applied to the FET RF amplifier which in turn applies its output to the next transistor mixer H102 through a high Q tuned circuit.

The mixer convert its input signal into 10.7MHz intermediate frequency and amplifies it at the same time. The H103 is a local oscillator and its output is injected into the base of mixer transistor, the injection voltage is about 40mV.

The 10.7 MHz front end output is led to the next IF section. The IF section consists of five stage of IF amplifier and one stage of sub IF amplifier. Two pieces of ceramic filters are also used to obtain high selectivity, a pair of symmetrical diode limiters are also employed for the best limiting characteristics, improved capture ratio and good AM suppression. A part of IF amplifier H105 output is rectified by the diode H115, H116 and its DC output is fed back to the gate of FET RF amplifier to decrease the gain with increased signal strength.

2.1 Muting and Auto-Stereo Switching Circuits

The muting circuit consisting of all solid-state electrical switching has been incorporated in the Model 105.

The DC voltage obtained by rectifying the sub IF output signal from the H109 is applied to the base of H110 and turns on it, if the sub IF output is greater than predetermined level (muting threshold level).

When H110 turns on, the muting switch transistor H111 is turned on, thus decreasing the emitter collector resistance to near zero ohm and allowing emitter current path to the Final IF amplifier H108.

When the input signal is lower than the predetermined level, the DC output obtained is small and can not turn on the H110, thus the H110 keeps its turn off state and this makes the switch transistor keep H111 turn off, then no emitter current is supplied to the H108 and signals below the threshold level are muted out.

The muting threshold level can be varied by adjusting the trimming resistor R153.

The DC voltage obtained is also used to make the Auto-Stereo switching transistor H112 turn on and off, and used to energizing the signal strength meter M001.

2.2 MPX Stereo Decoding Circuit

A Non-equalized audio signal from the FM detector is applied through the phase adjuster network of C148 and C161 to input terminal pin ① on the MPX decoder IC H114. The MPX decoder IC consists of a stereo decoder and postamplifier for the output. The right and left channel signals decoded by the stereo decoder H114, appear at pin ⑩ (right channel) and pin ⑪ (left channel), respectively. These signals are passed through the low-pass filters and de-emphasis networks to eliminate undesirable residual switching signals and are then delivered to postamplifier input pin ⑤ (right channel) and pin ⑦ (left channel), respectively. The signals amplified in the postamplifiers to the required level (approximately 10 dB) are delivered to pin ⑥ (right channel) and pin ⑧ (left channel), and are then passed through C169 and C168 to pin terminals J114 and J115, hence, through function switches to the "OUTPUT" terminal. Pin ⑯ on the MPX IC H114 is connected through R163 to the collector of the autostereo switch transistor H112, which turns on or off according to the incoming FM signal strength, thereby automatically switching between the stereophonic and monaural operations. The H112 turns on or off in accordance with whether the FM signal strength is more or less than approximately $25\mu V$.

2.3 Suggestion for Trouble Shooting of FM Tuner

2.3.1 Symptom: No FM Reception

First turn on the power switch and try to tune FM stations. Rotate the fly-wheel tuning knob slowly and observe the FM signal strength meter. If the signal strength meter deflect at several frequencies received, the tuner circuits preceding the discriminator circuit may have no failure. When no reading is obtained in the meter, check FM local oscillator circuit, using a RF VTVM. The normal local oscillator voltage is one or two volts (rms) at the tuning capacitor, depending on the tuning capacitor position. If the local oscillator voltage is normal, next check all voltage distribution in the FM Front End and IF amplifier unit and compare them with those shown in the circuit diagram. When signal strength meter deflects but no sound is obtained, check audio circuits, using high sensitive oscilloscope.

2.3.2 Symptom: No Stereo Separation

First check the "MONO" switch is in normal out position. Connect a FM RF signal generator output modulated by a stereo modulator to the rear FM antenna terminals, and check the stereo beacon is turned on or not. If not turned on, check for 19 KHz pilot signal and 38 KHz switching signal, using an oscilloscope.

3. AM Alignment Procedure

3.1 AM IF Alignment

1. Connect a sweep generator to the test point **(A)** or J107 and an alignment scope to the test point **(B)**.
2. Rotate each core of IF transformer L110 and L117 for maximum height and flat top symmetrical response.

3.2 AM Frequency Range and Tracking Alignment

1. Set AM signal generator to 525 KHz. Turn the tuning capacitor fully closed (place the tuning pointer at the low end.) and adjust the oscillator coil L115 for maximum audio output.
2. Set the signal generator to 1650 KHz. Place the tuning pointer in the high frequency end and adjust the oscillator trimmer on the oscillator tuning capacitor (CA-2) for maximum audio output.
3. Repeat the step 1 and 2 until no further adjustment is necessary.
4. Set the generator to 600 KHz and tune the receiver to the same frequency and adjust a slug core of AM ferrite rod antenna for maximum output.
5. Set the generator to 1400 KHz and tune the receiver to the same frequency and adjust the trimming capacitors of Antenna (CA-1) for maximum output.
6. Repeat the step 4 and 5 until no further adjustment is necessary.

Note: During tracking alignment reduce the signal generator output as necessary to avoid AGC action.

4. FM Alignment Procedure

1. Connect a FM signal generator to the FM antenna terminals and a oscilloscope and an audio distortion analyzer to the tape output jacks on the rear panel.
2. Set the FM SG to 87.5 MHz and provide about 3 to 5 μ V. Place the tuning pointer at the low frequency end by rotating the tuning knob and adjust the core of oscillator coil L103 to obtain maximum audio output.
3. Set the FM SG to 108.5 MHz and provide about 3 to 5 μ V output. Rotate the tuning knob and place the tuning pointer at the high frequency end and adjust the trimming capacitor C187 for Maximum output.
4. Repeat the step 2 and 3 until no further adjustment is necessary.
5. Set the FM SG to 90 MHz and tune the receiver to the same frequency. Decrease signal generator output until the audio output level decreases with the decreasing generator output. Adjust the antenna coil L101, RF coil L102 and IF transformer L105 for minimum audio distortion.
6. Set the FM SG to 106 MHz and tune the receiver to the same frequency. Adjust the trimming capacitor CF-1, CF-2 for minimum distortion.
7. Repeat the step 5 and 6 until no further adjustment is necessary.
8. Connect a DC VTVM with 1 volt range selected to the test point **(E)** (J120) and adjust the secondary core (upper) of discriminator transformer L107 so that no voltage reading is obtained on the VTVM at no signal.

Next set the FM SG to 98 MHz and increase the output level to 1 K μ V, then tune the receiver to the same frequency so that no deflection is obtained on the VTVM.

Adjust primary core (bottom) of L107 for minimum distortion, and adjust the L108 for the maximum deflection of FM signal strength meter M001.

4.1 STEREO Separation Alignment

1. Set the FM SG to provide 1 K μ V at 98 MHz.

Tune the receiver to the same frequency perfectly (so that the VTVM connected to the test point \textcircled{E} gives no reading).

2. Modulate the FM SG with stereo composite signal consisting of subchanged signal only (of course a pilot signal must be included).

Adjust the core of L110 for maximum audio output, then, modulate the FM SG with a stereo composite signal consisting of L or R channel only, and adjust the trimming resistor R161 for maximum and equal separation in both channels.

4.2 Muting Circuit Alignment

1. Set the FM SG output to provide 25 μ V (IHF) at 98 MHz and tune the receiver to the same frequency.

Adjust the trimming resistor R153 for the threshold level of 25 μ V (during this adjustment turn the MUTING pushswitch "on").

5. Test Equipment Required for Servicing

Table 1 lists the test equipment required for servicing the Model 105 Tuner.

Item	Manufacturer and Model No.	Use
AM Signal Generator		Signal source for AM alignment
Test Loop		Used with AM Signal generator
FM Signal Generator	Less than 0.3% distortion	Signal source for FM alignment
Stereo Modulator	Less than 0.3% distortion	Stereo separation alignment and trouble shooting
Audio Oscillator	Weston Model CVO-100P, less than 0.02% residual distortion is required	Sinewave and squarewaves signal source
Oscilloscope	High sensitivity with DC horizontal and vertical amplifiers	Waveform analysis and Trouble Shooting, and ASO alignment
VTVM	With AC, DC, RF range	Voltage measurements
Circuit Tester		Trouble Shooting

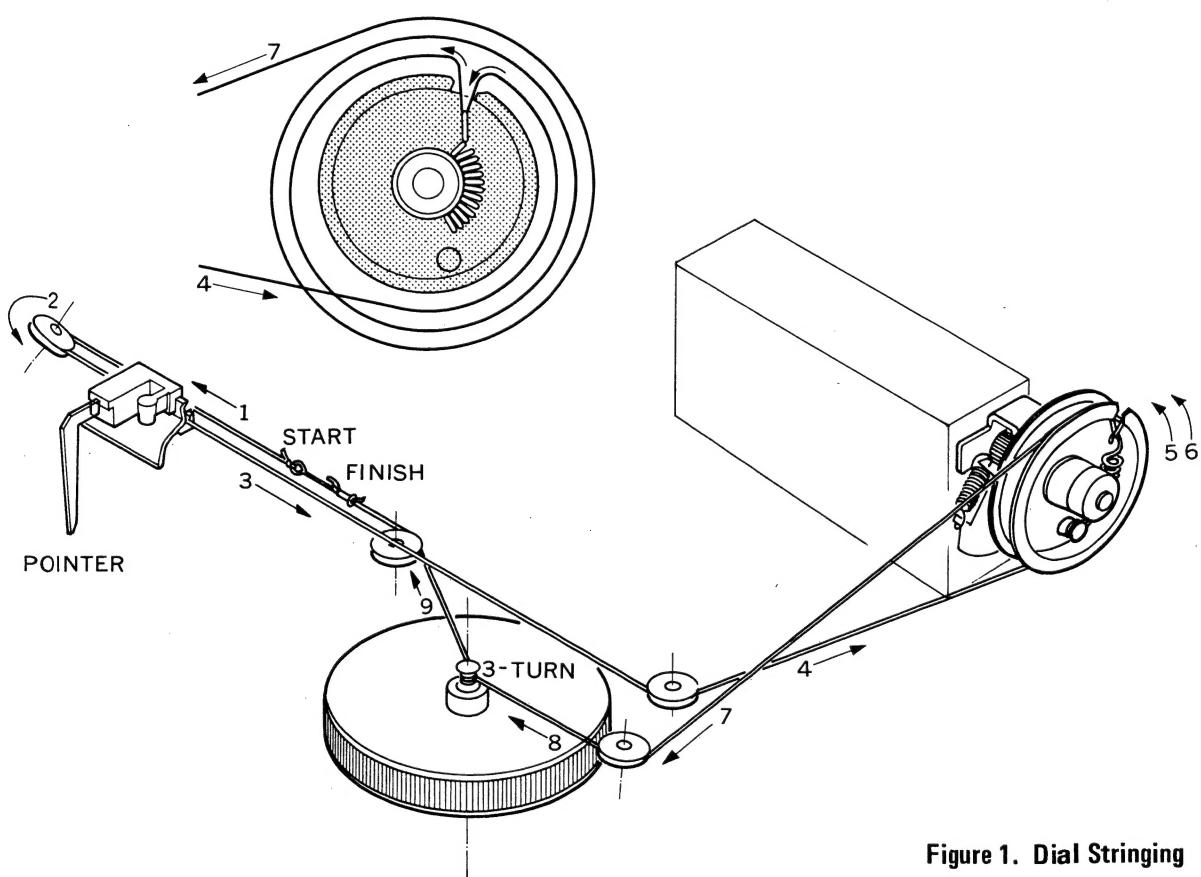


Figure 1. Dial Stringing

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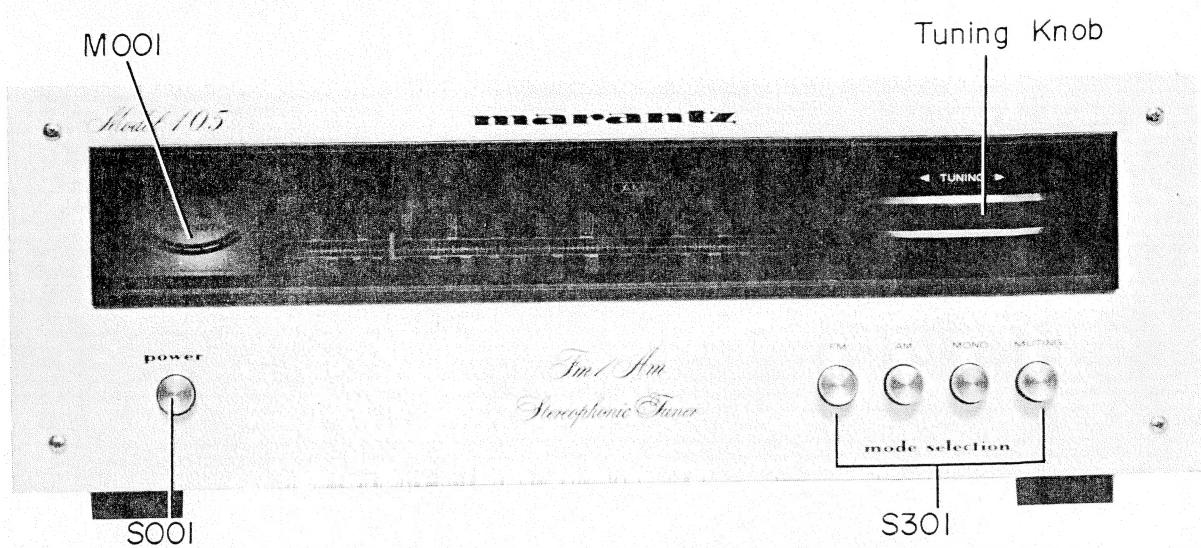


Figure 2. Front Panel Adjustments and Component Locations

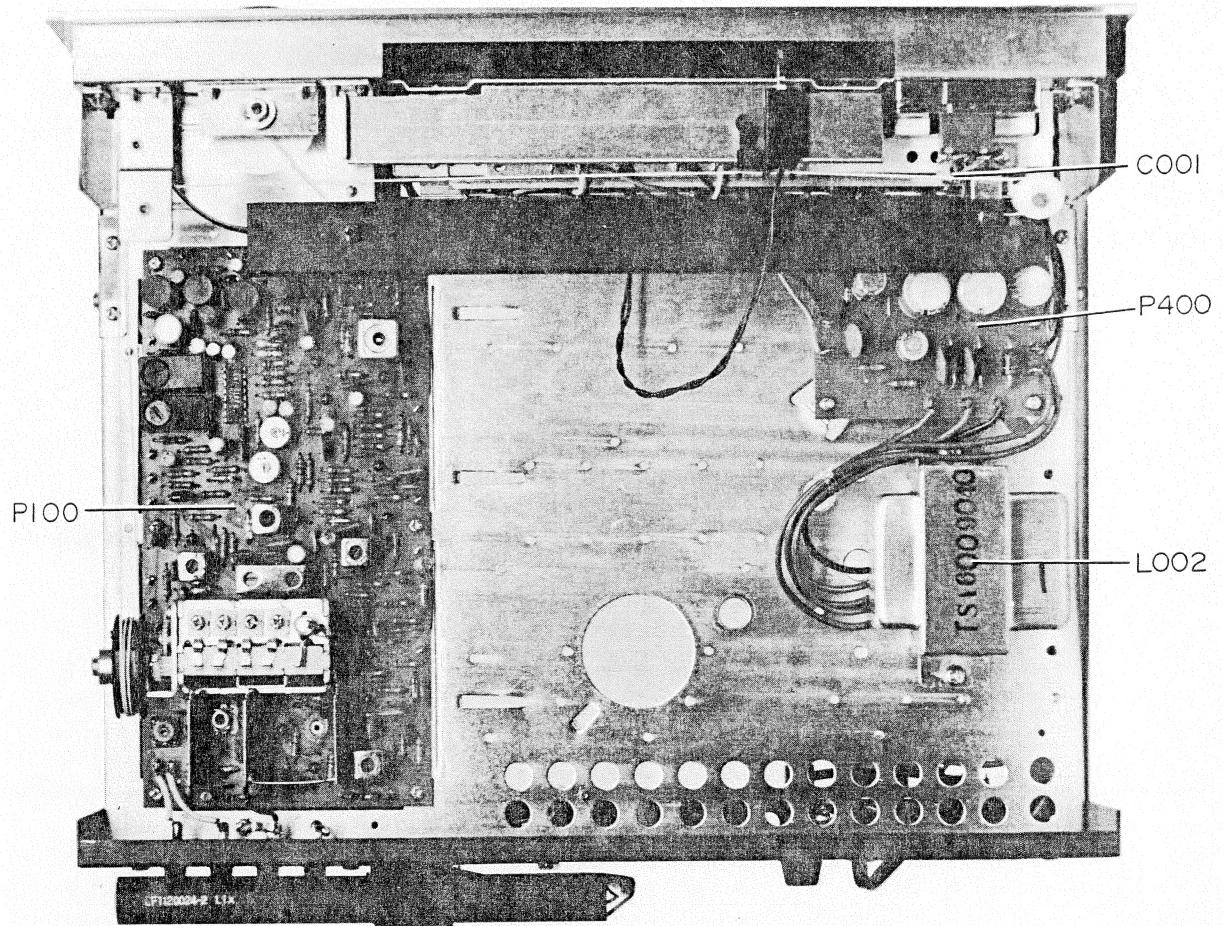


Figure 3. Main Chassis Component Locations (Top View)

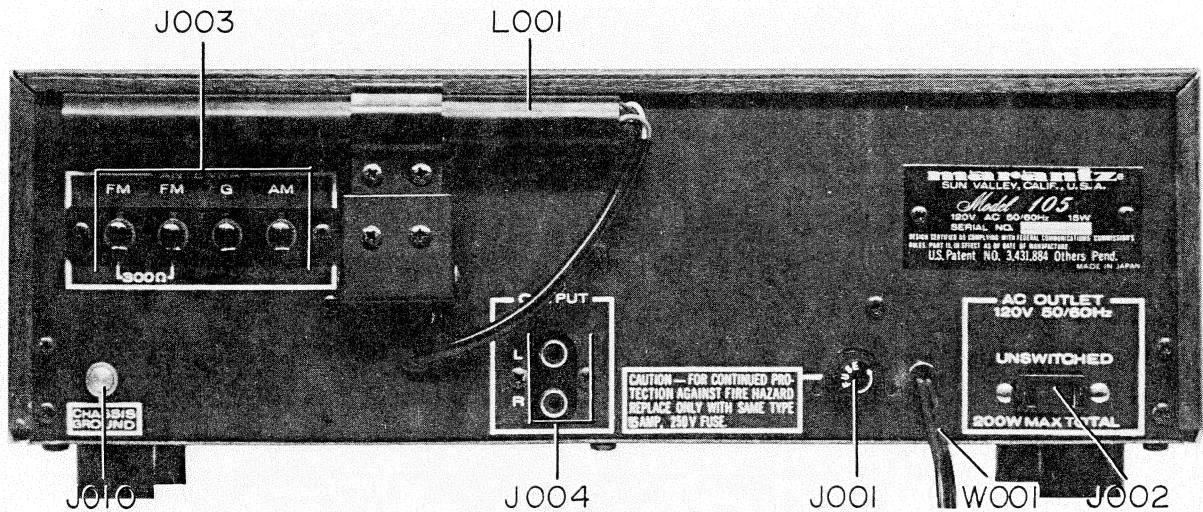


Figure 4. Rear Panel Adjustment and Component Locations

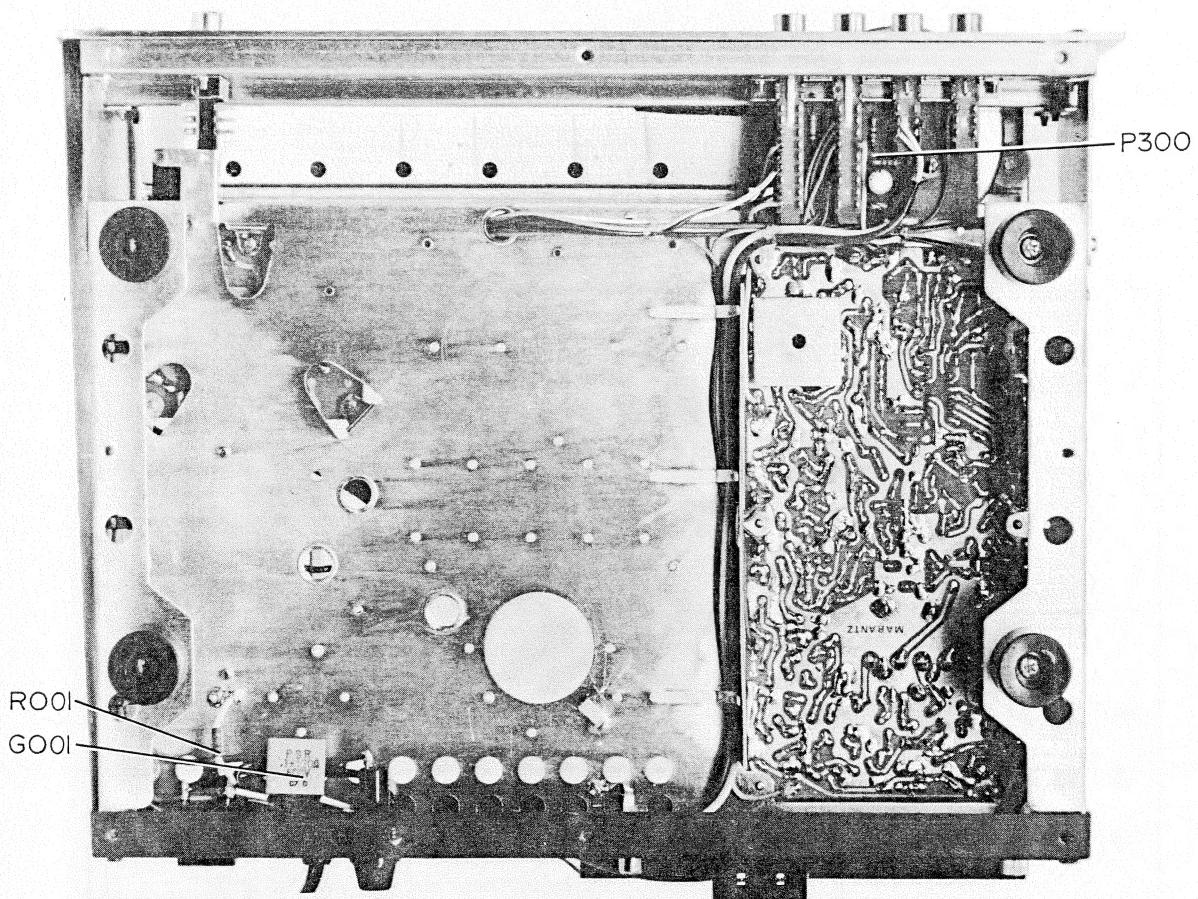


Figure 5. Main Chassis Component Locations (Bottom View)

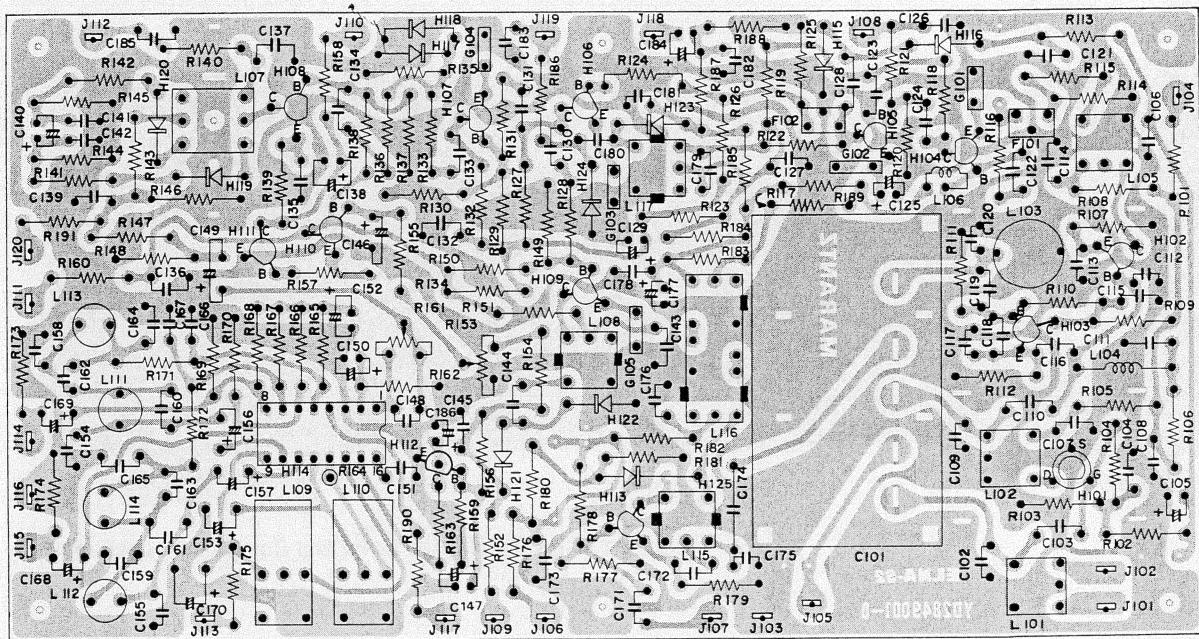


Figure 6. FM/AM Tuner Assembly P100 Component Locations

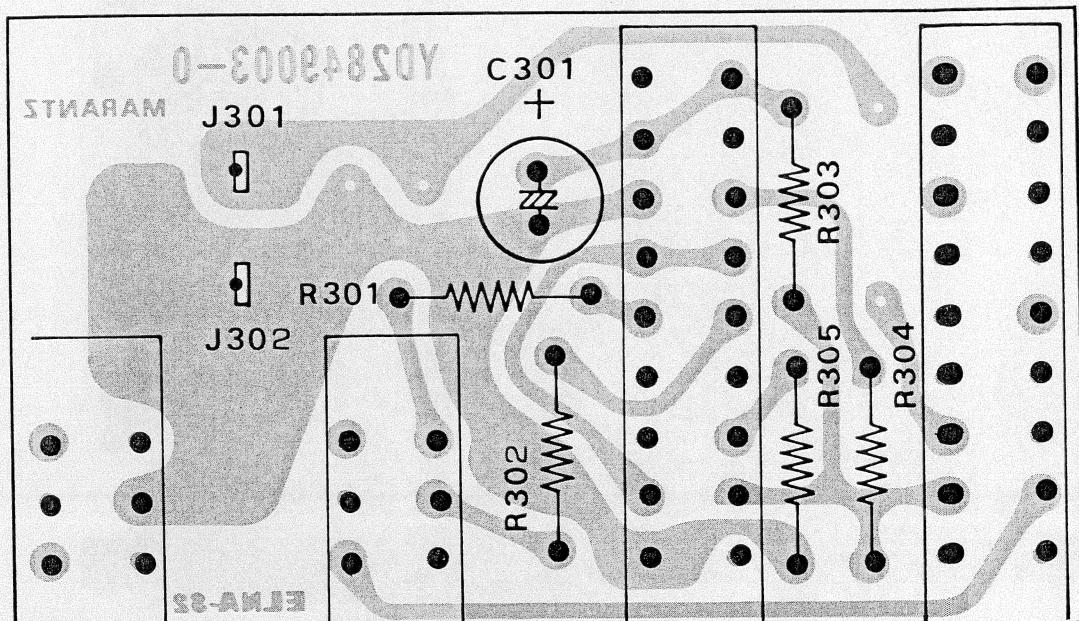


Figure 7. FM, AM, Mono and Muting Switch Assembly P300 Component Locations

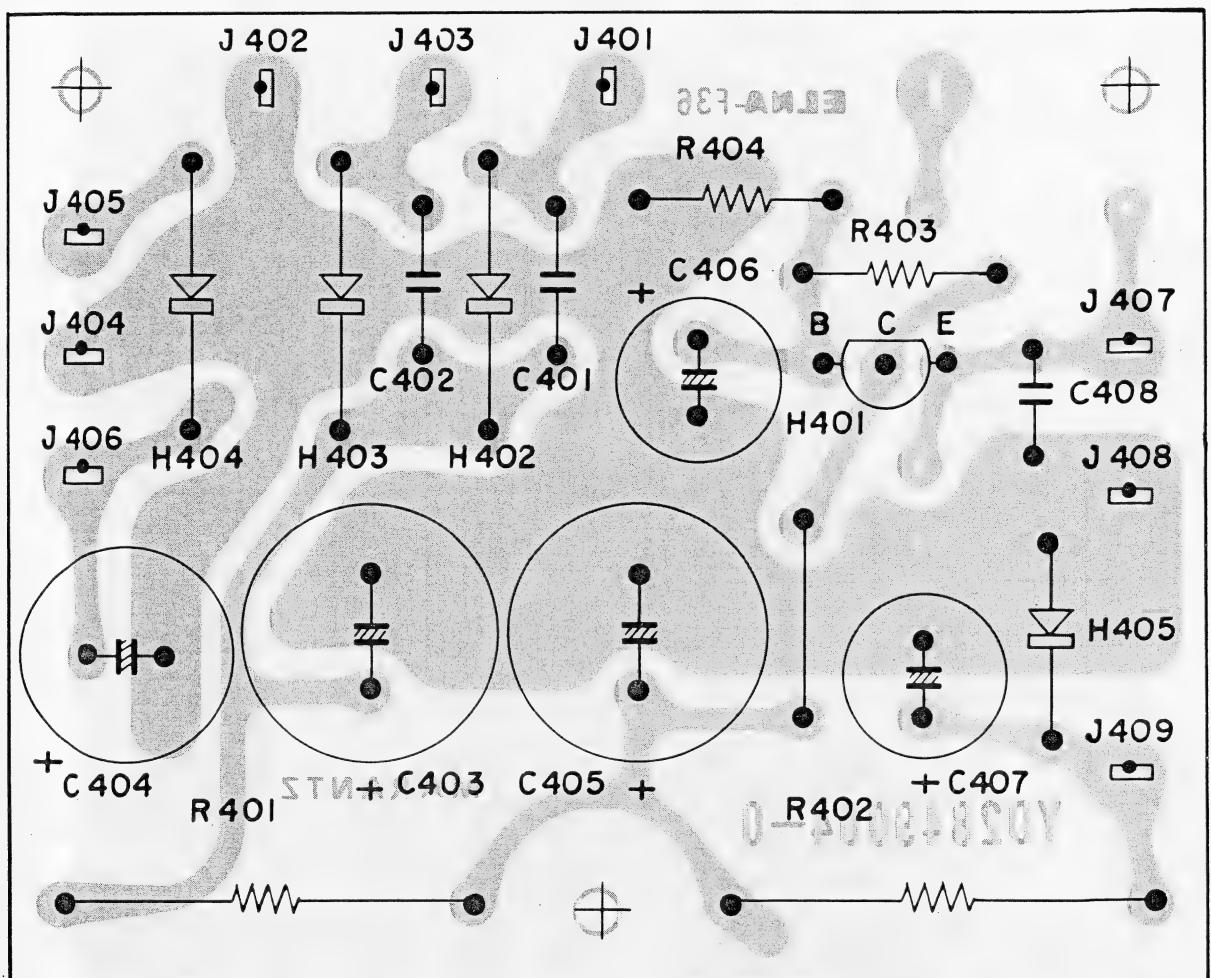


Figure 8. Power Supply Assembly P400 Component Locations

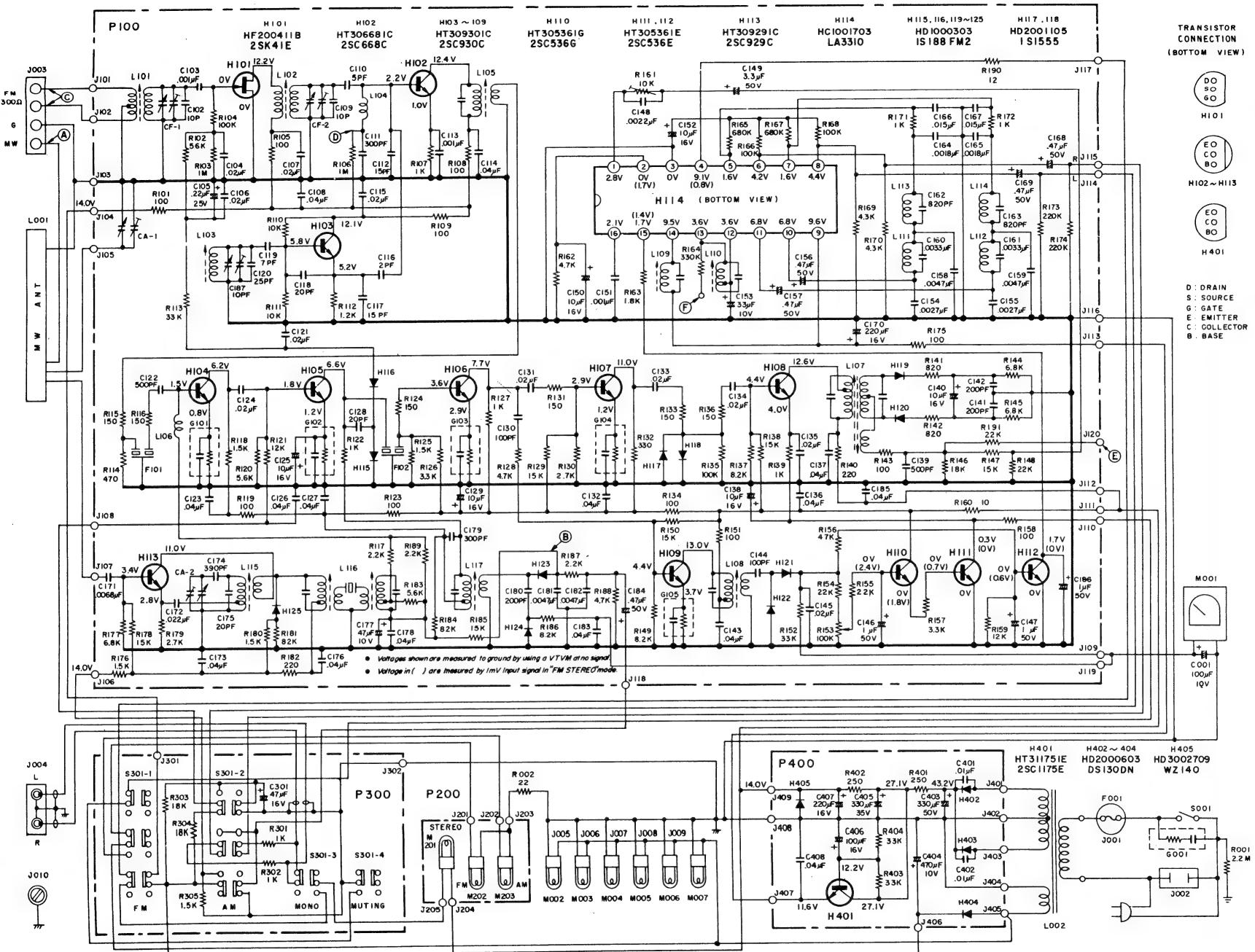


Figure 9. Schematic Diagram

PARTS LIST

REF. DESIG.	PART NO.	DESCRIPTION	REF. DESIG.	PART NO.	DESCRIPTION
P100	YD2849001 ZZ2849001	P.W. Board Tuner P.W. Board Assembly	R159	RT0512314	12KΩ
			R160	RT0510014	10Ω
R101	RT0510114	RESISTOR (All resistors are ±5%, 1/2W and carbon type, unless otherwise indicated.)	R161	RA0103020	Trimming 10KΩ(B)
R102	RT0556314	100Ω	R162	RT0547214	4.7KΩ
R103	RT0510514	56KΩ	R163	RT0518214	1.8KΩ
R104	RT0510414	1MΩ	R164	RC1033412	Solid 330KΩ±10%, 1/2W
R105	RT0510114	100KΩ	R165	RT0568414	680KΩ
R106	RT0510514	100Ω	R166	RT0510414	100KΩ
R107	RT0510214	1MΩ	R167	RT0568414	680KΩ
R108	RT0510114	1KΩ	R168	RT0510414	100KΩ
R109	RT0510114	100Ω	R169	RT0543214	4.3KΩ
R110	RT0510314	10KΩ	R170	RT0543214	4.3KΩ
R111	RT0510314	10KΩ	R171	RT0510214	1KΩ
R112	RT0512214	1.2KΩ	R172	RT0510214	1KΩ
R113	RT0533314	33KΩ	R173	RT0522414	220KΩ
R114	RT0547114	470Ω	R174	RT0522414	220KΩ
R115	RT0515114	150Ω	R175	RT0510114	100Ω
R116	RT0515114	150Ω	R176	RT0515214	1.5KΩ
R117	RT0522214	2.2KΩ	R177	RT0568214	6.8KΩ
R118	RT0515214	1.5KΩ	R178	RT0515314	15KΩ
R119	RT0510114	100Ω	R179	RT0527214	2.7KΩ
R120	RT0556214	5.6KΩ	R180	RT0515214	1.5KΩ
R121	RT0512314	12KΩ	R181	RT0582314	82KΩ
R122	RT0510214	1KΩ	R182	RT0522114	220Ω
R123	RT0510114	100Ω	R183	RT0556214	5.6KΩ
R124	RT0515114	150Ω	R184	RT0582314	82KΩ
R125	RT0515214	1.5KΩ	R185	RT0515314	15KΩ
R126	RT0533214	3.3KΩ	R186	RT0582214	8.2KΩ
R127	RT0510214	1KΩ	R187	RT0522214	2.2KΩ
R128	RT0547214	4.7KΩ	R188	RT0547214	4.7KΩ
R129	RT0515314	15KΩ	R189	RT0522214	2.2KΩ
R130	RT0527214	2.7KΩ	R190	RT0512014	12Ω
R131	RT0515114	150Ω	R191	RT0522314	22KΩ
R132	RT0533114	330Ω	C101	CA3240007	CAPACITORS Variable
R133	RT0515114	150Ω	C102	DD1210001	FM-3, AM-2 GANG
R134	RT0510114	100Ω	C103	DK1710201	10pF±10%
R135	RT0510414	100KΩ	C104	DK1820302	0.001μF±20%
R136	RT0515114	150Ω	C105	EM2240251	0.02μF ^{+100%} ₋₀
R137	RT0582214	8.2KΩ	C106	DK1820302	0.22μF 25V
R138	RT0515314	15KΩ	C107	DK1820302	0.02μF ^{+100%} ₋₀
R139	RT0510214	1KΩ	C108	DK1840302	0.04μF ^{+80%} ₋₂₀
R140	RT0522114	220Ω	C109	DD1210001	10pF±10%
R141	RT0582114	820Ω	C110	DD1105001	5pF±0.5pF
R142	RT0582114	820Ω	C111	DD1530101	300pF±5%
R143	RT0510114	100Ω	C112	DD1615003	15pF±10%
R144	RT0568214	6.8KΩ	C113	DK1710201	0.001μF±20%
R145	RT0568214	6.8KΩ	C114	DK1840302	0.04μF ^{+80%} ₋₂₀
R146	RT0518314	18KΩ	C115	DK1820302	0.02μF ^{+100%} ₋₀
R147	RT0515314	15KΩ	C116	DD1102004	2pF±0.5pF
R148	RT0522314	22KΩ	C117	DD1615003	15pF±10%
R149	RT0582214	8.2KΩ	C118	DD1520001	20pF±5%
R150	RT0515314	15KΩ	C119	DD1207003	7pF±1pF
R151	RT0510114	100Ω	C120	DD1525002	25pF±5%
R152	RT0533114	33KΩ			
R153	RA0104015	100KΩ(B)			
R154	RT0522314	22KΩ			
R155	RT0522314	22KΩ			
R156	RT0547314	47KΩ			
R157	RT0533214	3.3KΩ			
R158	RT0510114	100Ω			
		Trimming			

REF. DESIG.	PART NO.	DESCRIPTION	REF. DESIG.	PART NO.	DESCRIPTION
C121	DK1820302	Ceramic 0.02 μ F ^{+100%} ₋₀	C171	DF1768201	Film 0.0068 μ F ^{±20%}
C122	DD1650101	Ceramic 500pF ^{±10%}	C172	DF1722301	Film 0.022 μ F ^{±20%}
C123	DK1840302	Ceramic 0.04 μ F ^{+80%} _{-20%}	C173	DF1740301	Film 0.04 μ F ^{±20%}
C124	DK1820302	Ceramic 0.02 μ F ^{+100%} ₋₀	C174	DF6539101	Film 390pF ^{±5%}
C125	EA1060169	Electroly 10 μ F 16V	C175	DD1620001	Ceramic 20pF ^{±10%}
C126	DK1840302	Ceramic 0.04 μ F ^{+80%} _{-20%}	C176	DF1740301	Film 0.04 μ F ^{±20%}
C127	DK1840302	Ceramic 0.04 μ F ^{+80%} _{-20%}	C177	EA4760109	Electroly 4.7 μ F 10V
C128	DD1620001	Ceramic 20pF ^{±10%}	C178	DK1840302	Ceramic 0.04 μ F ^{+80%} _{-20%}
C129	EA1060169	Electroly 10 μ F 16V	C179	DD1530101	Ceramic 300pF ^{±5%}
C130	DD1610101	Ceramic 100pF ^{±10%}	C180	DD1620101	Ceramic 200pF ^{±10%}
C131	DK1820302	Ceramic 0.02 μ F ^{+100%} ₋₀	C181	DF1647201	Film 0.0047 μ F ^{±10%}
C132	DK1840302	Ceramic 0.04 μ F ^{+80%} _{-20%}	C182	DF1647201	Film 0.0047 μ F ^{±10%}
C133	DK1820302	Ceramic 0.02 μ F ^{+100%} ₋₀	C183	DK1840302	Ceramic 0.04 μ F ^{+80%} _{-20%}
C134	DK1820302	Ceramic 0.02 μ F ^{+100%} ₋₀	C184	EA4740501	Electroly 0.47 μ F 50V
C135	DK1820302	Ceramic 0.02 μ F ^{+100%} ₋₀	C185	DK1840302	Ceramic 0.04 μ F ^{+80%} _{-20%}
C136	DK1840302	Ceramic 0.04 μ F ^{+80%} _{-20%}	C186	EA1050509	Electroly 1 μ F 50V
C137	DK1840302	Ceramic 0.04 μ F ^{+80%} _{-20%}	C187	CT1100008	Trimming 10pF
C138	EA1060169	Electroly 10 μ F 16V			MISCELLANEOUS
C139	DD1650101	Ceramic 500pF ^{±10%}	G101	BF4030001	Printed Compo. 0.04 μ F + 270 Ω
C140	EA1060169	Electroly 10 μ F 16V	G102	BF2230008	Printed Compo. 0.022 μ F + 270 Ω
C141	DD1620101	Ceramic 200pF ^{±10%}	G103	BF2230007	Printed Compo. 0.022 μ F + 680 Ω
C142	DD1620101	Ceramic 200pF ^{±10%}	G104	BF2230006	Printed Compo. 0.022 μ F + 1K Ω
C143	DK1840302	Ceramic 0.04 μ F ^{+80%} _{-20%}	G105	BF2230006	Printed Compo. 0.022 μ F + 1K Ω
C144	DD1610101	Ceramic 100pF ^{±10%}			COILS AND TRANSFORMERS
C145	DK1820302	Ceramic 0.02 μ F ^{+100%} ₋₀	L101	LA1004606	Ant Coil FM
C146	EA1050509	Electroly 1 μ F 50V	L102	LA1027809	RF Coil FM
C147	EA1050509	Electroly 1 μ F 50V	L103	LO1203601	OSC Coil FM
C148	DF1722201	Film 0.0022 μ F ^{±20%}	L104	LC1751001	Choke Coil 0.75 μ H
C149	EA3350509	Electroly 3.3 μ F 50V	L105	LI1001601	IFT FM
C150	EA1060169	Electroly 10 μ F 16V	L106	LC1223002	Choke Coil 22 μ H
C151	DF1610201	Film 0.001 μ F ^{±10%}	L107	LI1401623	IFT FM
C152	EA1060169	Electroly 10 μ F 16V	L108	LI1015602	IFT FM
C153	EA3360109	Electroly 33 μ F 10V	L109	LS1031001	MPX Coil 19KHz
C154	DF1627201	Film 0.0027 μ F ^{±10%}	L110	LS1031004	MPX Coil 38Khz
C155	DF1627201	Film 0.0027 μ F ^{±10%}			
C156	EA4740501	Electroly 0.47 μ F 50V	L111	LC2226004	Choke Coil 22mH
C157	EA4740501	Electroly 0.47 μ F 50V	L112	LC2226004	Choke Coil 22mH
C158	DF1647201	Film 0.0047 μ F ^{±10%}	L113	LC2226004	Choke Coil 22mH
C159	DF1647201	Film 0.0047 μ F ^{±10%}	L114	LC2226004	Choke Coil 22mH
C160	DF1533205	Film 0.0033 μ F ^{±5%}	L115	LO1001042	OSC Coil AM
C161	DF1533205	Film 0.0033 μ F ^{±5%}	L116	LI1028002	IFT AM
C162	DF5582101	Film 820pF ^{±5%}	L117	LI1001048	IFT AM
C163	DF5582101	Film 820pF ^{±5%}			SEMICONDUCTORS
C164	DF1618205	Film 0.0018 μ F ^{±10%}	H101	HF200411B	FET 2SK41E
C165	DF1618205	Film 0.0018 μ F ^{±10%}	H102	HT306681C	Transistor 2SC668C
C166	DF1615301	Film 0.015 μ F ^{±10%}	H103	HT309301C	Transistor 2SC930C
C167	DF1615301	Film 0.015 μ F ^{±10%}	H104	HT309301C	Transistor 2SC930C
C168	EA4740501	Electroly 0.47 μ F 50V	H105	HT309301C	Transistor 2SC930C
C169	EA4740501	Electroly 0.47 μ F 50V	H106	HT309301C	Transistor 2SC930C
C170	EA2270169	Electroly 220 μ F 16V	H107	HT309301C	Transistor 2SC930C
			H108	HT309301C	Transistor 2SC930C
			H109	HT309301C	Transistor 2SC930C
			H110	HT305361G	Transistor 2SC536G
			H111	HT305361E	Transistor 2SC536E
			H112	HT305361E	Transistor 2SC536E

REF. DESIG.	PART NO.	DESCRIPTION		REF. DESIG.	PART NO.	DESCRIPTION	
H113	HT309291C	Transistor	2SC929C	H401	HT311751E	SEMICONDUCTORS	
H114	HC1001703	IC	LA3310	H402	HD2000603	Transistor	2SC1175E
H115	HD1000303	Diode	1S188FM2	H403	HD2000603	Diode	DS130DN
H116	HD1000303	Diode	1S188FM2	H404	HD2000603	Diode	DS130DN
H117	HD2001105	Diode	1S1555	H405	HD3002709	Diode	DS130DN
H118	HD2001105	Diode	1S1555	J401	YP1000099	MISCELLANEOUS	
H119	HD1000303	Diode	1S188FM2	J402	YP1000099	Plug	WZ140
H120	HD1000303	Diode	1S188FM2	J403	YP1000099	Plug	
H121	HD1000303	Diode	1S188FM2	J404	YP1000099	Plug	
H122	HD1000303	Diode	1S188FM2	J405	YP1000099	Plug	
H123	HD1000303	Diode	1S188FM2	J406	YP1000099	Plug	
H124	HD1000303	Diode	1S188FM2	J407	YP1000099	Plug	
H125	HD1000303	Diode	1S188FM2	J408	YP1000099	Plug	
MISCELLANEOUS				J409	YP1000099	Plug	
J101	YP1000099	Plug		0404	282716002	Bracket	
J102	YP1000099	Plug		0405	282711202	Shaft	
J103	YP1000099	Plug		0406	282711203	Shaft	
J104	YP1000099	Plug		0408	285020101	Partitioner	
J105	YP1000099	Plug		0409	285016003	Bracket	
J106	YP1000099	Plug		0410	285016004	Bracket	
J107	YP1000099	Plug		0412	285012201	Sticker	
J108	YP1000099	Plug		0421	257710602	Bearing	
J109	YP1000099	Plug		0422	141511801	Spacer	
J110	YP1000099	Plug		0508	285016007	Bracket	
J111	YP1000099	Plug		0509	173011203	Shaft	
J112	YP1000099	Plug		0510	257726201	Pulley	
J113	YP1000099	Plug		0517	282711801	Spacer	
J114	YP1000099	Plug		0611	51040306A	F.H.M. Screw	
J115	YP1000099	Plug		0615	51100306A	B.H.M. Screw	
J116	YP1000099	Plug		0618	51100306A	B.H.M. Screw	
J117	YP1000099	Plug		0621	51100306A	B.H.M. Screw	
J118	YP1000099	Plug		0623	51100306A	B.H.M. Screw	
J119	YP1000099	Plug		0625	51100306A	B.H.M. Screw	
J120	YP1000099	Plug		0626	51100306A	B.H.M. Screw	
0906	282110901	Shield		P300	YD2849003	P.W. Board	
0907	286710901	Shield			ZZ2849003	P.W. Board Assembly	
0908	285010902	Shield		RESISTORS			
1110	62031650W	Lug		R301	RT0510214	Carbon	1KΩ±5%1/4W
P400	YD2849004	P.W. Board	Power	R302	RT0510214	Carbon	1KΩ±5%1/4W
	ZZ2849004	P.W. Board	Assembly	R303	RT0518314	Carbon	18KΩ±5%1/4W
		RESISTORS		R304	RT0518314	Carbon	18KΩ±5%1/4W
R401	GJ1025102	Oxide	250Ω±10%2W	R305	GT0515212	Carbon	1.5KΩ±5%1/4W
R402	GJ1025102	Oxide	250Ω±10%2W	C301	EA4760169	MISCELLANEOUS	
R403	RT0533314	Carbon	33KΩ±5%1/4W	S301	SP0604003	Electroly	47μF 16V
R404	RT0533314	Carbon	33KΩ±5%1/4W	J301	YP1000099	Pushswitch	Band Selector
CAPACITORS				J302	YP1000099	Plug	
C401	DK1810351	Ceramic	0.01μF ^{+100%} _{-0%} 500V	S001	SP0301001	Pushswitch	
C402	DK1810351	Ceramic	0.01μF ^{+100%} _{-0%} 500V	M001	IM1104203	DC Meter	Signal Strength
C403	EA3370509	Electroly	330μF 50V	C001	EA1070109	Electroly	100μF 10V
C404	EA4770109	Electroly	470μF 10V	0417	285011801	Spacer	100μF 10V
C405	EA3370359	Electroly	330μF 35V				
C406	EA1070169	Electroly	100μF 16V				
C407	EA2270169	Electroly	220μF 16V				
C408	DK1840301	Ceramic	0.04μF ^{+100%} _{-0%} 50V				

REF. DESIG.	PART NO.	DESCRIPTION	REF. DESIG.	PART NO.	DESCRIPTION
0501	285016009	Bracket	0705	284916022	Bracket
0503	263711203	Shaft	0706	284916023	Bracket
0505	257726201	Pulley	0707	284916024	Bracket
0502	285016008	Bracket	0718	145525903	Bush
1436	263711203	Shaft	0723	282125901	Bush
1437	257726201	Pulley	0725	284906701	Cap
0414	281827101	Holder	0727	284906702	Cap
0631	51570306B	P.H. Tapt Screw	0814	51100306S	B.H.M. Screw
J005	YJ0800013	Socket	0828	53110303A	Hexagon Nut
J006	YJ0800013	Socket	0829	54050300R	T.L. Washer OR
J007	YJ0800013	Socket	0830	51060316A	F.H.M. Screw
J008	YJ0800013	Socket	0831	55060305F	T.R. Rivet
J009	YJ0800013	Socket	W001	YC0240010	AC Cord
M002	IN1008007	Lamp	G001	BF1040001	Printed Comp.
M003	IN1008007	Lamp	F001	FS1005007	Fuse 0.5A
M004	IN1008007	Lamp	L001	LF1120024	Ant Coil
M005	IN1008007	Lamp	0711	257816005	Bracket
M006	IN1008007	Lamp	0712	257816006	Bracket
0415	282716003	Bracket	0713	550203041	S.H. Rivet
0518	282710701	Sheet	0714	281927103	Holder
P200	YD2849002	P.W. Board	0806	51100308S	B.H. M. Screw
	ZZ2849002	P.W. Board Assembly	0807	54050300R	T.L. Washer OR
		MISCELLANEOUS	0808	53110303E	Hexagon Nut
M201	IN1006301	Lamp	0810	51100310S	B.H. M. Screw
M202	IN1006301	Lamp	0811	53110303E	Hexagon Nut
M203	IN1006301	Lamp	R001	GT0522512	Resistor
R002	RC1022012	Resistor Solid	1133	62031650W	2.2MΩ±5% 1/4W Lug
J201	YP1000099	Plug	0903	282715901	Drum
J202	YP1000099	Plug	0904	71101569M	Spring
J203	YP1000099	Plug	0915	51650304D	Set Screw H.P.
J204	YP1000099	Plug	B	284927340	Fly Wheel Assembly
J205	YP1000099	Plug	0427	257706302	Escutcheon
0413	282727401	Reflector	0429	257727301	Fly Wheel
0619	51570306B	P.H. Tapt Screw	0431	285011201	Shaft
0630	51570305B	P. H. Tapt Screw	0432	285011202	Shaft
0418	282705101	Guide	0607	53110603E	Hexagon Nut
E	284916040	Bracket Assembly	0608	54040602N	Spring Washer
0202	284926501	Indicator	0609	54020601E	Flat Washer P
0703	284916001	Bracket	D	285010340	Pointer Assembly
0816	53110403E	Hexagon Nut	0526	281810301	Pointer
0818	54020401E	Flat Washer P	0527	285010301	Pointer
0819	54050400R	T.L. Washer OR	0528	281805301	Cover
0821	55060307F	T.R. Rivet	M007	IN1008018	Lamp
0822	54050300R	T.L. Washer OR	C	285000640	Dial String Assembly
0824	51100306S	B.H.M. Screw	0512	120225801	Hook
0826	51100308S	B.H.M.Screw	0513	72080802A	String
0827	53110303E	Hexagon Nut	0635	56382540G	Eyelet
0832	51100308S	B.H.M. Screw			
0833	53110303E	Hexagon Nut			
J002	YJ0400018	Jack AC Outlet			
J003	YJ0104004	Terminal Ant.			
J004	YT0202007	Terminal Output			
J010	YL0301021	Terminal Ground			
0704	284916021	Bracket			

REF. DESIG.	PART NO.	DESCRIPTION	REF. DESIG.	PART NO.	DESCRIPTION
A	284906340	Escutcheon Assembly	0211	257886101	Label
0103	284906301	Escutcheon	0212	257886102	Label
0104	282740101	Frame	0213	257886103	Label
0105	282715801	Window	0214	250626506	Indicator
0106	281825905	Bush			UL Caution Do Not Remove Cover See Marking on Bottom Do Not Use As Handle
0108	284905301	Cover			
			0302	51122608E	T.H.M. Screw
			0304	51100406S	B.H.M. Screw
			0306	51100406S	B.H.M. Screw
			0307	54020401S	Flat Washer
W002	YW2849001	Wire Material	0424	257710601	Bearing
W003	YX2849001	Wire Material	0425	281810601	Bearing
			0433	281912002	Insulator
0121	275905701	Leg	0521	284930201	Dial
			0523	282705302	Cover
			0532	282626901	Protector
0310	51100410A	B.H.M. Screw	0603	51640412S	Set Screw C.P.
0311	54020401A	Flat Washer P	0604	54040402N	Spring Washer
0312	54040402A	Spring Washer	0605	53110403E	Hexagon Nut
1026	285010501	Chassis	0634	51100306S	B.H.M. Screw
1033	138200503	Clamper	0613	51100306A	B.H.M. Screw
1103	51570408B	P.H. Tapt Screw	0614	54050300R	T.L. Washer OR
1104	54040402N	Spring Washer	2236	138200503	Clamper
1108	51570306B	P.H. Tapt Screw			
1113	51570306B	P.H. Tapt Screw			
1122	51570306B	P.H. Tapt Screw			
1124	51100306S	B.H.M. Screw			
1126	51570306B	P.H. Tapt Screw			
1127	54050300R	T.L. Washer OR			
1128	59030805P	Washer			
1131	51570306B	P.H. Tapt Screw			
1132	54050300R	T.L. Washer OR			
1135	54050300R	T.L. Washer OR			
1117	53110303E	Hexagon Nut			
1112	51570310B	P.H. Tapt Screw			
L002	TS1600904	Power Transf. 120V			
0112	281815401	Knob			
0118	284925701	Lid			
0119	257711803	Spacer			
0120	282825702	Lid			

TECHNICAL SPECIFICATIONS

FM SECTION:

Tuning Frequency Range	88-108 MHz
IHFM Usable Sensitivity	3.0 μ V
IHFM Selectivity	50dB
Capture Ratio	2.5dB
Image Rejection Ratio at 106MHz	50dB
Signal to Noise Ratio (Mono)	65dB
Signal to Noise Ratio (Stereo)	55dB
Total Harmonic Distortion (Mono)	0.2%
Total Harmonic Distortion (Stereo)	0.5%
Frequency Response (ref. 75 μ sec. de-emphasis)	\pm 1dB, 50 Hz-15KHz
Stereo Separation at 1KHz	40dB

AM SECTION:

Tuning Frequency Range	540-1600KHz
Usable Sensitivity	20 μ V
Selectivity	20dB
Image Rejection Ratio at 1400 KHz	40dB
Signal to Noise Ratio	43dB
Frequency Response, -3dB down	50Hz-4KHz
Total Harmonic Distortion	1%

GENERAL:

Power Requirements	120V AC 50 to 60 Hz
Power Consumption	15 Watts
Dimensions Panel Width	14-11/64
Panel Height	4-23/32
Depth	11-1/32
Weight Unit alone	13.2 lbs
Packed for Shipment	25.5 lbs

*These specifications and exterior designs may be changed for improvement without advance notice.